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ABSTRACT

A cognitive approach to the interrelation of writing and reading assumes that production and comprehension of written text depend upon cognitive and affective schemata used in concert by a writer or reader to produce or encode, store, and retrieve text information. Both comprehending and composing are basic, complex, interactive processes with students varying in their ability to focus on getting or producing "straight" messages and predicting what messages or responses ought to be. In addition, both composition and comprehension involve prototypical knowledge of the subject matter and the structure or format of texts, the content schemata. Also involved is prototypical knowledge about processing factors--the procedures for composing and comprehending an extended definition or summary, for instance, which are called process schemata. Content and process schemata change in response to the demands of a situation and become more elaborate and specific with experience. A cognitive approach stresses the role of the teacher in helping students develop these structures, through direct instruction, experiences with reading and writing, and exposure to a variety of reading and writing tasks. With a cognitive approach to writing and reading relationships, it seems that composition and comprehension are very much alike: both use schemata for subject matter, micro and macro structure, and procedures. The sooner students become expert writers and readers, the sooner they can role play and become even more expert, with writers becoming reader-based and readers becoming writer-based. (HOD)

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Composition, Comprehension and Text Type Schemata

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Composition, Comprehension, and Text Type Schemata

Composition teachers, reading teachers, classroom teachers on all levels wonder about the relationship of writing and reading. Is the composing process really like the reading process? Is writing an outgrowth of reading? How much time should be spent on writing and how much on reading in a school curriculum? Should they be taught separate or together? If integrated, how does one refer to conjoint instruction? Would integration increase instructional efficiency? If reading influences writing, in what ways does it do this? Does learning to compose enhance reading comprehension? If so, precisely how would this happen? Does learning to use different kinds of structures (phrase, sentence, paragraph and discourse) in composition increase reading comprehension?

But teachers are not the only ones asking these questions, for literacy scholars, reading and composition theorists, cognitive scientists, and researchers also wonder about the nature of the relationship between reading and writing. Some of the questions have no answers yet from theorists or researchers, but there seems to be common agreement among scholars and researchers that reading influences writing growth (Kroll, 1977; Falk, 1979; Hayes, 1980). Few scholars and researchers, however, have addressed the questions of whether and how composition aids reading, particularly reading comprehension, and the related question of the effect (on reading comprehension) of learning to compose using different levels and types of structures.

These are interesting questions to explore because of their implications for composition and reading instruction. During the last several decades, it has been assumed that in language acquisition the sequence was from listening to speaking to reading and finally to composing written discourse. Because teachers came to depend heavily on workbooks and basal materials that seldom assigned free writing, students spent their time in the primary grades learning to read (Mason, 1981). They read narratives in the basals and listened to narratives read by their teacher because it was assumed that narratives were more familiar and consequently more appropriate for learning. Little time was spent on composing written discourse unless the teacher used a language experience approach.

When students moved into the intermediate grades where they were reading to learn, again most of the time was spent on reading because of the lack of writing tasks in the basal materials. Although composition entered the curriculum, they spent little time on it and what little composing was done was usually "creative" writing or encyclopedia reports. Teachers made no attempts to directly teach writing strategies, gave few opportunities to practice writing, and gave feedback in the form of accepting, positive remarks. Teachers assumed that writing couldn't be taught, that their time in the classroom was better spent on reading activities and other content-area activities, and that anything other than positive feedback would stifle expressive, creative writing and also the encyclopedia reports. Since writing was developmental, it was assumed that narratives, expressive writing, and an occasional encyclopedia report (a copied 'laundry list,' of course) was appropriate and that expository

prose of various types was inappropriate. Personal letters, however, were acceptable writing assignments. Most of the composition instruction focused on the sentence, for the primacy of the sentence was assumed. Sentences were important. Paragraphs and larger texts should come later.

Beyond the intermediate grades, during the last twenty years students spent their school time on content-area subjects learning content, devoting little time to reading instruction unless they were fortunate enough to have a reading program in their school. They read in the reading lab and wrote in the English classroom. They wrote sentences in the classroom and perhaps a few paragraphs but no essays or short stories or plays because teachers assumed that sentences should be learned first. When they were mastered (and only then) it was appropriate to teach the paragraph, so little time was spent on units larger than a paragraph. It was assumed that since a paragraph was a miniature essay, once students mastered the paragraph, they could write an essay. Essays could wait until Advanced Composition class or college. Longer units assigned should be narratives since students found them easier and more interesting to write. The cause and effect, classification, comparison-contrast, definition, argumentation, persuasive, problem-solution essays should wait for advanced composition in high school or college freshman composition. The news report, sports story or interview article should be taught in journalism class. The lab report was appropriately taught in advanced science classes. Short stories, plays, poetry, description, expressive writing belonged in creative writing classes.

If the assumptions help since the 1960's are not valid, however, students' experiences with reading and writing in schools should be quite different. Let's assume that students are developmentally ready to learn to write before they learn to read (Chomsky, 1971; Bissex, 1981; Mason, 1981) or that reading and writing develop simultaneously. Then these students would have teachers well-trained in compositional skills and methods in their pre-service training. Every day students would find opportunities to write different types of discourse beginning in the primary grades. Taking on the perspective of people engaged in various occupations who write using a special format, students would become the historian, scientist, advertiser, playwright, businessman, doctor, or news reporter. They would learn the special features of expository, descriptive, narrative and persuasive writing. There would be opportunities to learn the forms for comparison-contrast, problem-solution, classification, cause and effect, fables, and myths.

Teachers on all levels would make time to teach directly those conventional, paradigmatic forms needed for general writing and reading and those for content-area or function-specific writing and reading. From direct teaching and appropriate feedback students would learn the conventions for the various formats, the constraints on form and structure, discourse, paragraphs, and sentences. The approach to structures would be from whole to part; first the discourse, then the paragraph, and then the sentence. Along with the structures taught for composition would be repertoires of structural pegs, the signals of structures.

With the repertoires of structures and structural pegs learned from composition instruction, students would have the tools to comprehend the same structure in content-area, basal, and literature texts in addition to functional texts from non-school settings. If theory and research can support the notion that writing develops reading skills and that learning to use a variety of general and specific structures in composing increases comprehension then there are important implications for teacher education, school curricula, classroom instruction, and publication of educational materials.

A Cognitive Framework for the Composition-Reading Comprehension Relationship

During the seventies as Pearson & Camperell (1981) report, cognitively oriented research was directed toward understanding how information of any type was sorted and processed. This meant it was concerned with attention, encoding, inference, retrival, and reading comprehension. Cognitive researchers turned their attention to the composing process in the late seventies, focusing on problem-solving strategies, components of the composing process, and plans (Flower & Hayes, 1977; Sommers, 1978; Nold, in press).

Basic Cognitive Processes for Comprehension and Composition

Because reading and composing are both cognitive processes, the basic conclusions of the cognitive research on reading comprehension should hold for composition as well. One basic conclusion is that reading comprehension

(and composition by extension) is a complex interactive process (Rumelhart, 1977; Stanovich, 1980). According to Pearson (1981) a reader (or writer) varies his focus on a continuum ranging from being concerned primarily with producing a message or getting the message of the author straight (text-based processing) to concentrating primarily on predicting what the author's message ought to be or predicting what the reader's response ought to be (reader-based processing). A number of interrelated factors determine the variation of the focus. One factor is purpose (What do I have to do with this information once I've decided to convey it or read it?). Another is familiarity (How much do I already know bout the topic?). Interest and motivation is a third factor (How much do I care about conveying or learning about this body of content?). Finally, there is the factor of discourse type and complexity (How much do I already know about the conventions involved in this particular mode of discourse?). If educators can select those factors most easily influenced by instruction, they might be able to enhance composition and reading comprehension skills for students.

A second conclusion from the research on basic processes, Pearson notes, is that for reading comprehension (and composition as well), both content and process factors are involved. Content factors are the knowledge structures or schemata which reside in our long-time semantic memory and determine how well we understand how to produce or comprehend a particular text. Pearson (1980, p. 4) puts it clearly.

They are like what computer scientists call data structures. To put it simply, the more we know about the topic addressed in the text, the greater likelihood we will understand, integrate and remember the information contained in the text. (or write about the topic well)

That such knowledge structures or schemata for background knowledge exist and affect student's comprehension or retrieval of information has been verified in a number of studies (e.g., Anderson, Reynolds, Schallert, & Goetz, 1977; Pearson, Hansen, & Gordon, 1979).

In addition to knowledge of topic, there is another type of content that influences comprehension--knowledge about the text structure or text genre in which the topical content is embedded. Researchers have found that familiarity with rhetorical types of text influences comprehension. The area receiving the most emphasis has been narrative prose. Several studies (e.g., Stein & Glenn, 1979; Mandler, 1978, Thorndyke, 1977) have found that children do not understand narratives whose structure has been altered from the typical form as well as narratives whose structure is canonical. Recently, however, researchers have turned their attention to typical rhetorical structures found in expository writing such as technical prose (Just & Carpenter, 1980), problem-solution, comparison/contrast, description (Meyer, 1978, 1979-a, 1979-b) or cause/effect (Neilsen, 1977). Both topical and structural content have been found by researchers to influence comprehension and recall.

Process factors are the knowledge structures or schemata that determine how information is processed or generated in contrast to what information

is processed or generated. Procedures such as attending, encoding, generating, inferencing, retrieving, and the self-monitoring of these procedures are examples of process factors. Empirical researchers have noted a trend in developmental improvement of these processes, but their studies have not made clear what was responsible for the improvement (Paris & Upton, 1976; Pichert & Anderson, 1977; Pichert, 1979; Baker & Brown, 1981). The growth for the processes could be a developmental increase in cognitive capacity, an increase in world knowledge, the history of previous instruction and schooling, or a growing awareness that the processes are available and ought to be used (Pearson, 1981). What is clear is that comprehension and, by analogy, composition, since it is a cognitive process like comprehension, are both influenced by process schemata as well as topical and text organization schemata. It is also clear that if educators are to help students increase their comprehension and composition skills, they must understand the nature and function of schemata.

A Description of Schemata

The abstract knowledge complexes that people use to understand and generate spoken and written discourse are referred to by various terms such as schemata, scripts, frames, world knowledge, and domain knowledge. They have been described as abstract, prototypical structures (Anderson & Pichert, 1978; Minsky, 1975; Rumelhart & Ortony, 1977; Schank & Abelsen, 1977; Thorndyke, 1977). These structures are composed of variable slots or

constituents that combine in certain permissible ways to provide flexible, but logical organizational frameworks. People have schemata for objects (the prototypical notion of a chair), ideas such as love or justice, and actions and events (Pearson & Spiro, 1980). Typically, theorists operationalize schemata as 'grammars' that are based on a finite set of production rules. Using such grammars, researchers have successfully modeled the human knowledge structures that encode narrative and expository prose (e.g., Thorndyke, 1977). A theory about schemata is a theory about how people attend to remember and process information (Pearson & Spiro, 1980), but it is, in addition, a theory about how they compose texts. Writers have prototypical notions of what a letter is, the process for writing it, and receiving a reply. Understand schemata requires an understanding of their structural and processing properties.

Drawing on a number of authors who have empirically studied schemata, Schallert (1980) presented the following statements that are descriptions of the type of knowledge structures often referred to as schemata, believing that the descriptions might help to clarify the nature of schemata.

Structural Propositions

1 Schemata are abstract structures that represent what one holds to be generally true about the world.

1-A The structure of a schema is expressed as a specific configuration of variables.

1-B Some of the variables are obligatory; some are not.

1-C A particular schema is embedded in another schemata and itself contains subschemata.

1-D The configuration of the schemata making up one's knowledge is not static but dynamic, and changes from moment to moment in response to comprehension (or composition) process demands.

1-E Schemata develop, that is, they become more elaborate and more specific, with experience.

Processing Propositions

2 Comprehension (or composition) proceeds as values for the variables of a schema are determined, as a schema is instantiated.

2-A Values for variables are determined as a result of the interplay of bottom up (analytic) and top down (wholistic) processes.

2-B Input information that can be interpreted as a value of a variable is perceived as more significant; information that cannot fulfill a variable is perceived as less important, irrelevant or incongruous.

2-C Some values for instantiating a variable are more typical than other values.

2-D Activated schemata guide inferences.

2-E Higher-level schemata can constrain the interpretation and acquisition of input information (or the generating of output information).

Schema Theory and the Composition-Comprehension Relationship

This notion of schemata is a useful way to explain the nature of the relationship between writing and reading and to support the hypothesis that learning to write helps one learn how to read and that learning to write different genres of texts will increase reading comprehension. It stands

to reason that because writing and reading are both cognitive activities, writers as well as readers will have both higher-level and lower-level, embedded schemata. The writer's schemata like the reader's will be dynamic, changing from moment to moment in response to the demands of the composing or comprehending process. With experience and opportunities to learn, the writer's schemata become more elaborate and specific, as do the reader's. As a schema is instantiated (when values for the variable are determined) for the content or for the structure of a text, composing proceeds for the writer in the same way that comprehending does for the reader. Bottom up and top down processes interact for the writer and the reader. For each, if input information is interpreted as a value of a variable, it is perceived as significant (for instance, an element of narrative or expository prose types); if the writer or reader cannot see the information able to fill a variable slot, then each decides it is not important, relevant, or congruent. Both the writer and the reader make inferences about the text when these schemata are activated. Similarly, higher-level schemata constrain generation of information as well as comprehension.

Schemata and Lack of Familiarity

According to Spiro, (1981) it is likely that lack of familiarity with structure creates problems just as does lack of familiarity with content, If the only type of material a writer or a reader is exposed to is narrative, it seems unreasonable to expect him to be able to handle other types of text. Lack of familiarity implies a lack of available schemata for a

particular text type. Familiarity with a text type and with the structural cues allows a writer to convey information more appropriately according to the type of information, the purpose, the context of the situation, and the audience. He realizes that a literary description of his house would be the wrong structure if the intention was to sell the house by putting a house-for-sale ad in the local newspaper. In the same way, familiarity with the structures of different text types and cues allows the reader to find information more readily and know where inferences are required and what type they should be. For example, student who has never learned how to write a news report using the pyramid structure will have a good deal more trouble understanding news reports than a student who has had considerable exposure to them as a writer and reader.

Schemata for Oral and Written Discourse

One of the basic reasons for students' lack of familiarity with text structures is the differences between oral and written structures. Rubin (1980) notes that conversational structure is characterized by utterances that are context-sensitive, taking advantage of the fact that speaker and listener can interact. When a speaker makes a statement referring to the immediate situation that is not understood by the listener, he can ask the speaker to clarify and explain. The typical oral language experiences for students are conversations where they ask and answer questions or relate experiences. Written structures are very different from oral structures, requiring different schemata. Story structures contains such concepts as

"episode," "setting," and "theme." Expository texts have concepts as "thesis," "supporting evidence," and "topic sentence" and domain-specific structures like "process" or laboratory reports. Textbooks have structures such as problem/solution, compare/contrast, and definition/example. While conversational structures are typically more open, highly context-sensitive, redundant, and associative, written structures are typically more closed, conventional, and within-text or co-text sensitive (Takala, 1981). These differences require the development of sets of schemata, both text type and processing, in order for the student to compose and comprehend written discourse.

Schemata and the Author/Reader Relationship

The content domain of schema research has attempted to explain how a person's knowledge of the topic influences text comprehension and recall. Two clear findings have emerged from this work. First, readers recall more information when they take on a particular perspective such as a burglar, wrestler or music expert (Anderson, 1977; Anderson & Pichert, 1978) or when they have a higher degree of content knowledge (Voss, Vesonder, & Spilich, 1980). The second is that readers will make inferences consistent with their perspective (Owens, Dafoe, & Bower, 1979; Spiro, 1977, 1980).

The notion of taking the perspective of an expert, taking another's point of view, or role playing may help explain why those students who become experts at composing different genres and discourse types might comprehend better. The skilled reader would take on the role of the author,

activating schemata for genres, selecting the appropriate schemata, and maintaining the schemata throughout the entire text. By taking the author's perspective, the reader would recognize author intention, tone, and style, be more sensitive to both audience and situation, and form intelligent hypotheses about structures and content from minimal text cues. The reader who becomes the author as he or she reads will be sensitive to the constraints and conventions of the various prose types and to the variables that make a difference in the effectiveness of the message and that particular prose type.

Researchers working out of a schema-theoretic tradition have focused on the structure of knowledge that must be analyzed, rather than on the textual, gestalt-like properties that can only be felt (Spiro, 1980). When a writer engages in the act of composition, his experience of that act has diverse aspects. One aspect is the possibility of a verbal description of the composing process. Flower and Hayes (1979) studied such descriptions in their subjects' protocols. Verbal descriptions of the act of composing, however, miss the "existential" aspect of the act, for they do not include what the experience of writing a short story, a play, a technical description, or an argumentative essay feels like. Each genre, each text type, has its own "texture," "color," or "flavor" that a writer feels when he experiences the act of writing it, a general impression of the whole. Barlett (1932) called these summary feelings "attitudes" and gave them a central place in the constructive process after noting that his subject's recalls were justifications of their general impressions of the whole, (their "attitudes").

It might be possible that authors who have previously experienced various text types by feeling them wholistically will be better readers and recallers of those same text types. The possibility is based on Spiro's proposal (1980) that these wholistic "signatures" of past events precede and facilitate comprehension and retrieval of detailed information (this might be a definition essay, but it just doesn't feel right). If readers took on the role of authors, they could read more efficiently since the summary feelings are single units or chunks, thought of all at the same time and rapidly, allowing for better use of their limited processing ability.

Efficiency could also result because, although it is not possible to think analytically about two things at the same time, it may be possible to think about one thing while simulataneously feeling several others. If the content of the text required analytical thinking by the reader but the structure of the text did not because he had experienced the structure before as an author, processing could occur more effectively with the cognitive and affective schemata working in concert.

Reading and writing are reciprocal and mutually reinforcing processes because both involve the structuring of meaning (Elkind, 1976). Both authors and readers structure ideas in forms such as paragraphs, stories and essays. The point of providing students with opportunities to structure ideas through the writing process according to Ribovich (1977) is that readers get a firm notion of what idea structuring really is when they have to do

it. They acquire and develop schemata for idea structuring which they can transfer from the writing situation to the reading situation. With these schemata, they can uncover the author's structure more successfully or in case of author disorganization or lack of structure, they can mentally generate their own structure and impose it on the text.

Kroll (1977) sees the reader and writer as complementary roles. Based on Britton's 4 stage model of writing, pre-writing and writing can be viewed as the writer's role; reconsidering and editing can be seen as the reader's role. Both roles can be developed with exercises based on reading instruction. Scanning can be used to show the author/reader the need for highlighting the topic and signaling the subtopics with markers when writing. Teaching reading survey skills in order to see the need for stating a thesis clearly and placing it in the appropriate position, can help writers write more readable prose and getting meaning from titles by skimming can help writers create meaningful titles. "Role" denotes from a point of view (as in "to assume a role") and activity (as in "to play a role in a drama"). For better learning, authors and readers need to assume and play complementary roles.

The notion of contract as it relates to the role of writers, the role of readers, and the nature of reader-writer relationships is discussed by Tierney and LaZansky (1980). Both readers and writers have rights and responsibilities; in other words, they have a contractual agreement, an agreement which defines the roles of each in relation to the text. Tierney

LaZansky argue that whenever an author or reader fails to abide by the terms of the contract, meaning suffers. A writer has a responsibility to be sincere, informative, relevant, clear, and establish points of contact between the communication and the reader's experiences. He or she must respect the audience and attend to its needs. A reader has responsibilities, too. He or she must assume that a writer communicates for a certain purpose(s) to a certain audience, implying that it is important to consider for what and for whom a particular text is intended. Although the author makes a contract with the reader and the reader makes a contract with the author, this does not mean both agree to the same terms. Each may have different purposes, but a robust text can support wide audiences and devise reader purposes. The text, rather than bearing meaning explicitly, represents meaning or cues to meaning. The author must provide enough clues for the reader, and the reader must appropriately use the author's clues.

In terms of schemata and structure what this means is that authors have a responsibility to develop and elaborate schemata for the various text structures so they can choose the appropriate structure for the purpose of the text and the reader. Some structures are more appropriate than others for readers, depending on the reader's stage of development. Psycholinguists have found that some sentence constructions are more difficult for poor readers to process than others (Davison, 1981). On the discourse level, Meyer (1979) found that comparative/contrast text structure was better comprehended and recalled than a list structure for ninth graders. Authors also have a responsibility to acquire and fine-tune

schemata for structural cues--the devices that signal the structure to the reader. Poor readers need these structural cues to uncover the author's structure and meaning (Marshall & Glock, 1979).

Readers, too, have responsibilities for acquiring, selecting, and maintaining across sentences and text units those schemata for structure and structural clues that will help them comprehend. Authors and readers must agree to a structural contract for an effective author-reader interaction.

Collins and Gentner (1980) give an example of writers violating their structural contract. One of the most important objectives in writing is enticingness, and suspense is often used to achieve this objective. Desiring to meet the enticingness objective, novice writers in science attempt to keep their readers in suspense in order to surprise them with their conclusion. They give an incorrect view in their introduction and their true view of the topic in their conclusion. Most readers have expectations about the structure of scientific articles, however, especially if they are also authors, and do not expect to see an incorrect view defended and thus are put off by the writing. Poor readers might accept the incorrect view as that of the writer with serious confusion as a result. The use of suspense in a scientific article is a violation of the author's structural contract with the reader.

When a reader imposes a structure on a text different from the author's structure, or reads informative texts for pleasure, he deprives the text

of its genre. Reading a pleasure text for the sake of information, for example, turns it into a document (Ryan, 1979). Readers, like authors, may violate the author-reader contract for structure or purpose with serious consequences resulting for the author-reader relationship.

Microstructures and the Composition-Comprehension Relationship

Structure exists at several levels: word, sentence, paragraph, and text, with longer texts having additional intermediate levels (Collins & Gentner, 1980). The word and sentence level constitute the microstructures of texts. Most of the research literature showing the effect of composing microstructures on comprehension comes from a linguistic framework. Researchers used transformational and sentence combining theories as a basis for their studies.

For instance, Evanochko et al. (1974), investigating the relationship between children's performance in written language and their reading ability, wished to determine the best combination of indices of writing performance to predict reading achievement. They concluded reading ability was indicated by two factors: number of communication units (a group of words that cannot be further divided without the loss of their essential meaning) and control of syntactic complexity as indicated by what the authors called Two Count Structure (structures consisting of passives, paired conjunctions, dependent clauses, comparatives, participles, infinitives as subjects, appositives, or conjunctive adverbs). The study found a high correlation between language and reading measures and a strong interaction between

receptive reading behaviors and expressive writing behaviors. The evidence suggested certain language skills are common to both reading and writing and acquisition of these skills should produce performances in both reading and writing.

Building on this study, Hughes (1975) found that there was a close link between a students' reading level and the same students' syntactic maturity; that the greatest gain in reading comprehension resulting from sentence combining appeared to be from poor and average readers; and that experimental students made large gains in writing fluency. Klein (1980) discussed how to integrate reading comprehension instruction and writing instruction through the use of sentence combining. His belief is that integrating reading comprehension and writing through transformationally based sentence-combining activities are central to language production and language analysis. Manipulations of sentence structure, (immersing students in the intracacies of the sentences), in the internal workings of sentences, is a fundamental to comprehension.

Hutson (1980) argues that helping students develop a rich sense of language structure results in concepts that are a base for development of skills in reading and writing. Although listening is a useful approach to acquiring structure concepts, writing is an even more powerful approach. Because our primary concern should be with the whole, interlocked language system, we must provide functional, integrative experiences in reading and writing by having students manipulate both micro and macro structures through additions, deletions, rearrangements, and substitutions and then notice the effects on meaning, text types, and audiences.

Linguistic connectives, as Pearson and Camperell (1981) point out, are a sensible bridge between the studies looking at the reading-writing relationship on a sentence level and those on the higher text levels. This notion stems from the fact that when a connective is used in a sentence, it often has the effect of increasing the grammatical complexity of the sentence just as sentence-combining does. Elementary age students prefer descriptions of causal relations that are made explicit by the use of connectives. Marshall and Glock (1978-1979) found that explicitly stated logical structures such as "if-then" statements resulted in better recalls of discourse for "not-so-fluent" (community college) readers. The recalls of good readers indicated a better understanding of the underlying structure of the text than did the recalls of poorer readers who focused primarily on context. Marshall suggests that these differences are due to good readers having more well established schemata that can be used to interpret and store the meaning of discourse whereas poorer readers have less complete structures and, therefore, must depend to a greater extent on information explicitly encoded in the surface structure of text.

Macrostructures and the Composition-Comprehension Relationship

Narratives. According to Pearson and Camperell (1980) story grammars specify a set of rewrite rules for decomposing the relations among propositions in a story similar to the way phrase structure grammars have rewrite rules to decompose a sentence. When the rewrite rules are applied to a story using sentences or propositions as basic units, an inverted tree

diagram of the story results which creates a hierarchy. The setting, basic theme, key episodes in the plot, and resolution to the problem in the story are at the top of the hierarchy. The subplots are at the lower levels.

In Pearson and Camperell's review of the literative on narratives (1980) they noted that story grammarians assume that students acquire schemata for stories through constant exposure and that comprehension and recall of stories will be influenced by two kinds of variation. First, readers will recall information in the higher levels modes because the units are more basic. Second, if the author violates the well-formedness of the story by reversing the order of key events, having unmotivated actions, or putting setting information at the end, readers will have problems with comprehension and recall. Rumelhart (1975, 1977) and Thorndyke (1977) found that readers do in fact recall more information from the higher level modes of stories. Researchers looking at canonical story structure violations (Thorndyke, 1977; Mandler & Johnson, 1977; Stein & Nezworski, 1978) found subjects could recall more when the stories were well-formed than when they were disorganized. Stein and Glenn (1977) and Mandler and Johnson (1977) found that as children increased in age, they remembered more information in the lower nodes of the story.

One study looked at the effects of direct instruction of a simplified story schema on recall of high-level information. Gordon (1980) trained fifth graders to use the simplified story schema on their basal readers. She found there was better recall of higher-level information on a transfer

story for the trained students than for the untrained students. This finding suggests that direct instruction in story schemata provides students with a transferable framework that helps them understand and recall stories more effectively.

Exposition. Because reading and writing are reciprocal mutually reinforcing processes involving the structuring of meaning, Shanahan (1980) suggests that the manipulation of organizational structures in writing could enhance the use of such structures in reading comprehension. By manipulating organizational patterns such as comparisons, cause and effect, enumerative order of chronological sequence, students might be able to increase reading comprehension and retention. Knowledge of text patterns does seem to enhance reading comprehension (Meyer, 1979), but as yet no investigations of the development of such strategies through writing have been reported. In fact, research and theory about the macrostructure of expository text is less abundant than that for narrative.

Meyer (1975) developed a text structure system based on Grimes' (1975) theory of connected discourse and Fillmore's (1968) theory of case grammar. Her system emphasizes relations among propositions in a text. She shows the case relations between words within sentences and clauses with lexical propositions and establishes the relation between and among sentences, paragraphs, and longer units of text with rhetorical propositions. Rhetorical predicates, labels used to specify the relationships within these propositions, are used to order the ideas in a text into hierarchical relationships. Her

basic thesis is that height in the hierarchy predicts how well propositions will be comprehended and recalled. Using a schema-theoretic orientation, Meyer (1978) hypothesized that the skilled reader approaches text with knowledge of how texts are conventionally organized. For a particular text the reader selects the schema in her/his repertoire that best accounts for it. Aspects of the text structure and signaling such as the words "the solution is" suggest which schema can best be employed. The schema selected by the reader to comprehend the text functions like an outline. She used the same schema orientation and hypothesis for predicting how skilled writers produce structured texts (1979).

Meyer and Freedle (1979) used schema theory to predict that when readers followed top-level rhetorical structures of response (relating a problem to a solution or question to an answer), adversative (relating what did happen to what did not or a favored view to an opposing view), covariance (relating an antecedent condition to its consequent) they would comprehend and recall better than when they followed an attribution structure (relating a collection of attributes to an event or idea). They found that their graduate student subjects remembered significantly more information with the adversative (contrastive) and covariance (cause-effect) structures than they did with the response (problem-solution) and attribution (list-like) structures.

Their prediction was based on the theory that although each of the four types of structure are used in expository texts to let readers know information will be presented about a topic, additional schemata for

understanding and recalling would be provided to readers with the adversative, covariance, and response structures. Attributive structures are more loosely organized and do not provide additional schemata. They explained their unexpected finding for the response structure with the notion of perspective. The subjects were school teachers reading from that perspective a passage about firing coaches. The teachers seemed to reject the schema provided by the author, read the text from their own perspective or personal viewpoint, and thereby processed the text differently than was expected. The teachers imposed their own schema on the text perhaps indicating that content schema can override structure schema in some situations.

In another study, Meyer, Brandt, and Bluth (1978) looked at whether identifying and using the organizational structure of texts and whether signaling devices were present in the texts affected recall. They found that good readers organized their protocols with the same structure as that used in the passages read and recalled significantly more information than students who did not adopt this strategy. The same results were found regardless of whether the signaling devices were present or not. The strategy of using the author's "schema" to organize recalled information was a better predictor of recall than either standardized comprehension or vocabulary text scores on both immediate and delayed tests. Signaling apparently facilitated recall for poor and average readers on the immediate test but not on the delayed recall test. These readers organized their recall protocols with the same schema as the author's and recalled more

information than the poor and average readers reading passages with signaling devices in the immediate test but not in the delayed test. It is interesting to speculate that had the poor and average reader the opportunity to develop and elaborate both cognitive and affective schemata for these structures with direct teaching and practice in written composition, they would have performed differently on the delayed test.

Acquisition and Development of Text Type Schemata

The conventional, prototypical text types can be viewed as formulas. Olson, for instance, (1977; in press) has pointed out that language is acquired through use of formulas. In discussing this aspect of language acquisition, Tannen (in press) states:

> Children do not learn the meanings of words and then learn rules to put them together, like Tinker Toys and sticks. Rather, they learn certain strings of words uttered with certain intonation patterns and other paralinguistic features, which they know are appropriate for utterance in certain social settings. Only after repeated successful use of various sayings in various settings do they begin to extrapolate rules which they apply--with varying success--to generate other sentences.

It seems plausible that what is true for the acquisition of oral language must also be true for the acquisition of written language. Only after repeated successful use of various formulaic text types in various settings do children begin to internalize and extrapolate the text type rules from one situation to another. Learning to write very formulaic, constrained

text-types by internalizing the rules or acquiring elaborate schemata should transfer over to a reading task using the same formulaic text types. The highly constrained formulaic text types can act as a bridge between oral discourse and written discourse that is not so highly constrained, a situation frequently found in the longer units of written discourse.

The Range of Text Types

The cognitive approach to the study of writing and reading processes assumes that production and comprehension of written discourse depends upon cognitive structures used by the writer or reader to produce or encode, store, and retrieve discourse information. This approach assumes that these structures have developed through direct instruction, writing and reading experiences, and exposure to various task types and that they govern the set of expectations that writers and readers have about the information and structures that should occur in a given text. These expectations influence how the information and structure to be produced, comprehended or remembered is processed. The theoretical bases for this approach to the composing and reading process derive from schema theory and story grammars, both of which postulate the existence of higher order organizational structures.

As Cunningham (1978) points out, research in story grammars has attempted to explicitly describe the cognitive structures used by writers or readers to produce and comprehend written discourse of a particular type--the narrative story. It is apparent that research has focused on simple stories

and that the "grammars" do not generalize beyond that text type. As yet, no one has produced "grammars" for expository or descriptive texts. Written discourse exists in many forms, but it is clear as Cunningham (1978) notes that as yet no comprehensive and psychologically valid classification of text types exists and that it will first be necessary to portray the range of text types commonly used in order for psychologists to identify the cognitive structures associated with text types.

Cunningham reviews several models of text types: (a) the psychological models of Fredericksen (1975), Kintsch (1974), and Meyer (1975) have provided a description of a particular text passage but not a particular type of text; (b) the Rhetorical models of the literary tradition which are many and varied and would include Aristolte's classification of epic, tragedy, comedy and lyric poetry, D'Angelo's (cited in Kinneavy, 1980) classification of expressive, persuasive, literary, and referential, and Kinneavy's models of narration, description, classification and evaluation. Brewer (1977) based his classification on literary theory and psychology, producing the two dimensions of discourse structure which are grounded in underlying cognitive structures appropriate for each structure and discourse force. Discourse structure includes descriptive, narrative, expository, and poetic; discourse force includes informative, entertaining, persuasive, and literary-aesthetic. Cunningham believes Brewer's definitions of discourse structure and force seem arbitrary and without theoretical significance, but are a starting point in the distinctions of text types. (c) The philosophical

models of Morris (1946, 1964) with its two dimensions of discourse use: informative, valuative, incitive, systemic and discourse mode: designative, apprasive, prescriptive, and formative. This system, too, according to Cunningham has its problems. It fails to deal adequately with the full range of characteristics likely to be necessary in depicting the differences in discourse types.

The methodology Cunningham proposes for developing a psychologically valid taxonomy of texts involves several stages: (a) Determine the range of discourse types by searching the literative and disciplines useful for a school age population for passages. (b) Construct a taxonomy with few dimensions. (c) Develop grammars for text types. (d) Construct ideal or prototypic passages. (e) Test the grammars, (f) Investigate the variation within existing texts. The grammars would be tested developmentally to determine their growth and suggest factors which may encourage their development, to identify the structures which are available at various ages, and to investigate the consequences of their availability or absence.

General and Content-Specific Text Structures

Several problems exist for researchers and educators interested in developing cognitive skills needed for composition and comprehension. First is the problem of whether there are global thinking skills that can transfer to novel situations or content-specific thinking skills that are not transferable to other content-area subjects. Another problem is whether schools should foster general or content-specific thinking skills (assuming

there are these two types) given constraints of time and money in the school setting. Both composing and reading are thinking activities, and the same problems exist for these areas. The issues of whether there is anything such as global "writing" and "reading" face educators and test-makers as well.

Are there global writing and reading skills and conventions that can be taught, and tested? Or are there only content-specific skills and conventions? Since comparison/contrast, problem/solution, classification, and narration are found in many content areas, should teachers concentrate on these more general text types? Would teaching the characteristics of narrative, descriptive and expository writing in general be adequate for developing strategies for different forces or purposes for description such as a technical description to inform, an ordinary description to entertain, a house advertisement to persuade, or a poetic description for literary-aesthetic purposes? Does each content have structures and text types requiring strategies specific to that content? Just what should be the curriculum for composition and reading skills?

The solution to the general versus domain-specific thinking problem, Bransford (1980) suggests, is to offer both. Many would agree that this is the solution to the general/content-specific problem in composition and reading also. Herber (1978), however, believes that reading in the schools should be content-specific. He argues that teachers should use the material the students are required to read for teaching them how to

do it successfully since this eliminates the transfer problem. Teachers should teach students only those skills needed to understand the ideas that the curriculum calls on them to understand; they should not teach general reading skills for their own sake. Interestingly enough, though, when Herber discusses the patterns constituting the "internal organization" of the text, he only recommends teaching four organizational patterns characteristic of expository material in general: cause/effect, comparison/contrast, time order, and simple listing, ignoring the possibility that a content-area subject may have organization specific to it.

General Text Forms

The examples of text-level forms that occur in writing used by Collins and Gentner (1980) to illustrate structural devices are examples of general text forms. They discuss first, the Pyramid Form, the structure that covers the most important ideas or events and then fills in on successive passes through the material, more and more detail in descending importance. This structure is exemplified by newspaper articles and textbooks designed to teach effectively. The material is covered in the order easiest to learn. The Story or Narrative Form is any text structured according to the temporal and causal relations between the events that occurred. Fiction and scientistic writings where scientists describe their thoughts and actions in a temporal sequence are both narratives. Argument Form, found in only expository texts, consists of several formulas for the structure of argumentation. Originally developed by the Greeks for orations, it is now used

in written discourse for legal briefs and scientific articles. One formula has the form: introduction, background, definition of issues, statement of what is to be proven, arguments for and against the thesis, refutation of opposing arguments, and summation. The last form discussed is Process-of-Elimination Form, an inverted pyramid structure where the writer makes an argument by eliminating all the possible alternatives. This form is good for persuasion, but risky for holding interest because it begins with least important and interesting first and builds to a climax.

Nash (1980) admits that much prose has a free and random development that is difficult to describe and sometimes prose has a design-at-large that emerges slowly from a number of constituents; yet the rhetoric of expository prose is reducible to a few primary designs. One such design he calls the Step. This design is characterized by a recurrent syntactic element, so it is a predictive design. For instruction text types, the recurring element is the imperative verb form and use of optional ordinal expressions like first, then, before. For stage directions, the recurring syntactic element is the place adverbial which is also the recurring element in description of place or landscape. The Step is used in narrative, often to set the scene. Here the recurring element could be identical or near-identical sentence structures. The syntactic regularity sets up a pattern which the reader can predict and enjoy. A second predictive, stereotypical pattern or design described by Nash is the Stack. The principle governing this design is one of definition and extension; a topic is announced at the beginning of the text or text segment and becomes "the modal point of

divergence and convergence, the home key, as it were, for the ensuring discourse." The thematic or 'topic' sentence is followed by a Stack of amplifying comments later to be rounded off by some kind of summary statement.

The Chain design has a pattern of construction underlying it that resembles a chain; it presents a series of items each of which is related to its predessor by means of explicity verbal links. There are connectives running from one sentence to the next in a schema of linkage. The links between sentences may be repeated words, a parallel or echoic constructions, pronouns or demonstratives or a combination. Nash calls this an exploratory design because the writer works through the expository maze one sentence at a time giving syntactic and lexical clues to the reader. Another variety of exploratory rhetorical design is the Balance. In this procedure, the writing shifts between proposition and counter-proposition with the intention of inviting the synthesis of conflicting claims in argument. There is no inclination to prejudge, but only to explore alternatives. This design can be exploratory like the Chain or predictive and stereotypical like the Step and the Stack.

Content-Specific Text Frames

It is commonly agreed that the author's purpose in writing is reflected in many aspects of the text's structure. The premise that authors of content-area texts have specific information-providing purposes, aims, orientations is basic in the approach Anderson and Armbruster (1980) take

toward writing and reading expository texts. The basic structural component of text is what they call the text unit which consists of the author's purpose stated in the form of a question and the response to that question. They identify five text types (purposes and corresponding text structures) fundamental to expository texts. (a) "What is X?" with a definition or description response. (b) "What are some examples of X?" with an exemplification structure consisting of a list of objects, events, or processes and their defining attributes. (c) "What are the logical devisions or parts of X?" with a classification response. (d) "When did (or should) these events occur in relation to each other?" with a temporal sequence response. (e) "How" or "Why" about the topic with an explanation response.

According to Anderson and Armbruster, author purposes may take a more complicated form, higher-order text structures they call frames.

> Frames represent a combination of text-units and reflect typical, high probability ways of organizing the information. There appear to be a few general schemata and a larger but finite number of more specific schemata associated with each content area or discipline. These schemata are manifest in content area textbooks as frequently repeated frames. The most widely used general frames in textbooks seem to be the compare/contrast, problem/solution, and definition of example frames . . . . . In addition to such general frames, textbooks also include content-specific frames. (p.)

The authors use the "scientific theory" frame and "process" frame as examples of content-specific frames. The "scientific theory" frame includes six major types of information about scientific theories: description,

inventory/history, consequences of the theory for mankind, evidence for the theory, other similar or competing theories and a miscellaneous category for extra information. The "process" frame includes as categories: function(s) of the process, an explanation of how the process works, and where the process takes place. Because each category of information in a frame contains an implicit question and suggests the kind of information needed as a response to that question, it actually corresponds to a basic text unit.

It seems clear that students will learn to compose and comprehend text types more adequately once they have acquired "the few general schemata and the larger but finite number of more specific schemata associated with each content area or discipline," those general and more specific frames, and literary texts. The identification of all these specific schemata or frames and their properties remains a problem yet for theorists and researchers to solve .

Culture and Text Types

Another text-type problem is the relationship of the text frame, (whether general or specific), and its use in particular social contexts. The whole complex of cultural issues enters the picture here. Some of the text types are not only specific to context areas, disciplines, and certain kinds of literature, they are also specific to cultures and subcultures (Ryan, 1979).

Sociolinguists and anthropologists have long studied the ways of speaking in different speech communities. Hymes (1974, cited in Scribner,

1979) considers genres and performances as basic categories for studying these special ways of speaking. He defines genre as stylistic structures of organized verbal forms with a pattern for whatever lies between the beginning and end. Simple genre would include greetings, farewells, riddles, proverbs, and prayers. Complex genre would include tales and myths. He defines performances as the use of genres in particular contexts. Speech communities vary in both genres and performances and in the relationship between them as well since in some communities certain genres may be context-bound while in others they might range over diverse events and situations.

Genres are a socially evolved language structure. Individuals in a particular society develop a cognitive schema for the genre through experience. Through cognitive schemata, they assimilate increasingly more complex examples of the genre. Individuals remember the form of a genre like the syllogism, remembering the general relationship between premises, even when they forget the particular subjects and predicates used (Scribner, 1979). Scribner states that the structure of socially evolved genre such as narratives and formal problems confers "sense" on the presented material and serves as a guide to the comprehension, retrieval, and retention of the material. Depending on their cultural background and their own personal life experience, individuals acquire or internalize these socially evolved genre in varying degrees. Clearly, researchers and educators must be sensitive not only to the developmental and general versus domain specific issues concerning text structures but also the cultural issues. This so because the arbitrary relationships of text structures may be in opposition

to the accumulated knowledge of an individual and assimilation of the text type schemata may decrease rather than increase comprehension, recall, and problem-solving (Scribner, 1979). The poor writer or reader from different sub-cultures may have special genre problems to overcome in addition to many others on the road to literacy.

Metacognition and the Composition-Comprehension Relationship

Writers and readers are often insensitive to their own failures in composing and comprehension. Young children and below average students fail to detect the inadequacy of the message they send and fail to request clarifying information concerning inadequate messages they receive (Asher, 1978; Shatz, 1978). In addition to not recognizing the adequacy of the content in a message, they also fail to detect the adequacy of the text type form. The skill needed to detect these failures is a monitoring skill, one type of metacognitive skill.

Metacognition refers to understanding of knowledge reflected in either effective use or overt description of the knowledge in question (Brown, 1981). One of the main issues in metacognition is the degree of understanding according to Brown. A writer or reader can be said to understand a text type if she/he can use it appropriately and discuss its use. There are, of course, degrees of understanding, for learners can often use knowledge effectively without being able to verbalize about it, and some learning disabled students find it impossible to apply or discuss knowledge or a rule they have acquired (Brown, 1981). Looking at knowledge of what a text

means (i.e., understanding) broadly, Petrosky (1981) views reading, responding, and writing as aspects of understanding and sees the need to include extended written responses to texts in models of comprehension. The present models equate comprehension with literal recall, ignoring the roles of affect and interpretation in remembering. He argues that students compose as they comprehend and that their "composition" is a result of four factors: the text, affective and cognitive schemata, and the context for reading. Schemata can account for both the format and content in reading, the shape and content of comprehension, and by extension, response and writing.

Petrosky (1981) and Bleich (1978) both agree on the need for metacognitive skills on the learners part. Learners must overtly describe their knowledge as well as use it. Both believe that using extended discourse (where readers become writers who articulate their understandings of and personal involvements in the text) is the only way to demonstrate comprehension. Their students make meaning for themselves by writing a combination of expressive and explanatory prose in a structured response format originated by Bleich as a heuristic. The format requires beginning with references to the text and then moving into personal narratives that tell the story of their relationship to the text. The personal narratives "anchor assertions, explanations, and generalizations in concrete data bases that give credence to the composition, fulfilling the same function as examples and illustrations" (Petrosky, 1981, p. 16).

Learners are using metacognitive skills when they write about the reading comprehension strategies they use or the composing strategies

they use for producing a particular text type. Verbalizing about rules used to compare or comprehend a text type helps learning and transfer of those rules (Brown, 1981). Teachers could accelerate the learning and transfer process for composing and comprehending different text types by forcing students to explicitly state a reason for each move they made in the composing or reading process or explicitly state the text type rules.

Transfer is an important issue in metacognition and concerns the concepts of multiple and reflective access. Students may know perfectly well how to use a strategy or rule for a particular text type such as a complaint letter but fail to access it on appropriate occasions. Brown (1981) notes that both American and Soviet psychologists suggest one of the primary problems with young and below average learners is that they tend to "weld" acquired information to the form and context in which it was acquired. For instance, a student who learned how to write a cause/effect composition in English class might not use that form in history class, when it was appropriate to do so. Reflective access is another problem for young students and slow learners in writing and reading. The ability to reflect on one's own cognitive processes, to be aware of one's own activities while reading or composing is a late-developing skill with important implications for students' effectiveness as an active, planful learner (Baker & Brown, in press).

Other important metacognitive skills needed to compose and read text types effectively include these self-regulatory procedures: checking the

outcome of any attempt to solve the composing/comprehending problem, planning one's next move, monitoring the effectiveness of any attempted action, testing, revising and evaluating one's strategies for learning. These are not stable skills--older children and adults use them sometimes but not always. Learners of any age are more likely to regulate themselves in cognitive activities if the tasks are neither too easy (Why bother?) not too hard (I give up). After students become aware of their own cognitive processes and monitor their progress well enough to detect problems, then they need to use a remedial strategy to overcome the problem. Consequently, they need a large repertoire of strategies to meet the goal of the composing or reading activity (Baker & Brown, 1981). One example of a remedial strategy is the "structure strategy." Producing an appropriate text plan or schema for a composition task following another author's schema in a reading task, and using the author's schema in a recalling task are all types of "structure strategies" (Meyer, 1981). The "structure strategy" is a valuable tool for students to have in their metacognitive "tool box."

Summary

In summary, a cognitive approach to the interrelation of writing and reading assumes that production and comprehension of written text depends upon cognitive and affective schemata used in concert by a writer or reader to produce or envade, store, and retrieve text information. Both comprehending and composing are basic, complex, interactive processes with students

varying on how much they focus on getting or producing "straight" messages and predicting what messages or responses ought to be. Whether students are text-based or reader-based and to what degree depends on their purposes, familiarity with the topic, discourse conventions, interest and motivation. In addition, both composition and comprehension involve prototypical knowledge of the subject matter and the structure or format of texts, the content schemata. Also involved is prototypical knowledge about processing factors--the procedures for composing and comprehending an extended definition or summary, for instance, which are called process schemata.

Content and process schemata change in response to the demands of a situation and become more elaborate and specific with experience. New schemata can be formed by old schemata interacting with each other. Student decisions about whether information is significant and relevant for producing or understanding a text depend on high-level schemata availability, selection, and maintenance throughout the "construction" of a text. A cognitive approach stresses the role of the teacher in helping students develop these structures, though direct instruction, experiences with reading and writing, and exposure to a variety of reading and writing tasks. A cognitive approach assumes that the schemata govern the expectations that writers and readers have concerning the content and organizational structure will find in a given text. These expectations influence the composing or comprehending processes for the text.

Knowledge of prototypes--the typical, conventional, general case--is important in this approach. Students must be familiar with text content,

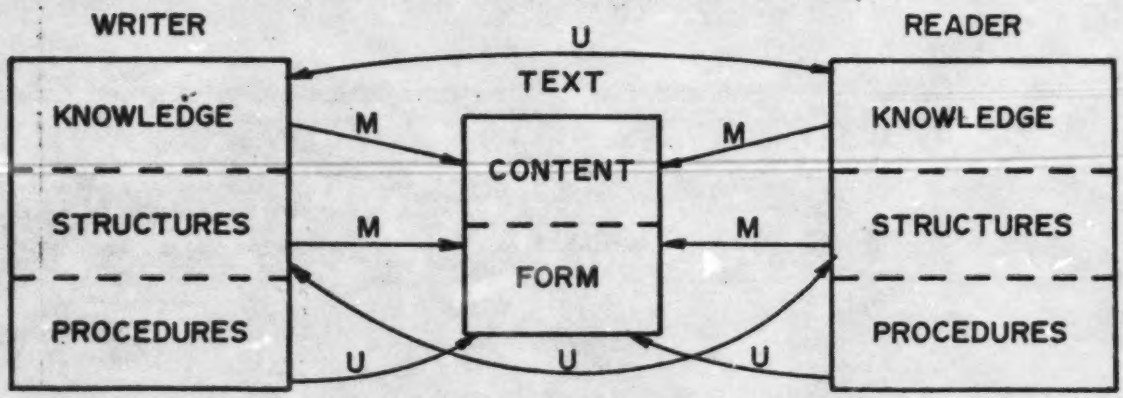
structure, and processing prototypes or schemata. To promote this familiarity, teachers must help students understand the difference between oral and written text structures. To promote appropriate schemata activation, and maintenance, writers should be encouraged to take on the role of the expert reader, and readers encouraged to take on the role of expert writer. Role taking leads to active involvement of the student and recognition of textual constraints, conventions and cues. Important also for role taking are the felt experiences or summary feelings students have as they write or read specific text types. When students use analytic cognitive schemata along with wholistic affective schemata, composing and comprehending processes should proceed more effectively and efficiently. Since role taking fosters the acquisition and development of idea and text structuring, transfer should occur between writing and reading situations. Moreover, role taking helps insure non-violation of the contractual agreement concerning author-reader rights and responsibilities, especially the responsibilities to provide and use clues to meaning and to provide and use appropriate structures according to the demands of the situation. Violating the contract damages the important author-reader relationship needed for effective communication.

It is necessary for teachers and students to understand that structure exists at two levels: a microstructure level (words and sentences) and a macrostructure level (paragraphs and longer texts). Immersing students in the intricacies and internal workings of sentences by using sentence-combining is fundamental to both composition and comprehension. It is

important to have students work on a both the micro and macro structure levels in reading and writing experiences using addition, deletion, rearrangement and substitution manipulations to understand the effect on text structure and the whole language system. Also important is understanding that linguistic connectives are the link between the microstructure and macrostructure levels. Explicit connectives are important clues to meaning in texts when readers do not have adequate schemata for text content, structures, or processing.

On the macrostructure level, research shows that students understand, remember, and transfer better narratives that are typical and well-formed according to convention. Teachers, therefore, should realize that students can profit from direct instruction of narrative schemata. There is also some evidence that students also profit from direct instruction in expository text patterns for producing and comprehending structured texts because skilled writers and readers select cognitive and affective schemata appropriate to the task demand, using them as outline or organizational devices. Acquiring and developing schemata for text types requires repeated successful use of a variety of formulaic text types in different settings for internalizations of text type rules and transfer to occur. Direct teaching of highly constrained formulaic text types can help bridge the gap between oral discourse and written discourse that is not so formulaic. Highly constrained formulaic texts are an easier problem to solve for student writers and readers than non-formulaic texts.

One of the biggest problems in the writing-reading relationship is the lack of communication between writers and readers concerning the knowledge each has and the procedures each uses in "constructing" a text. This communication problem is shown in the illustration below. By helping



M = MEDIATED
U = UNMEDIATED

students to acquire and elaborate process schemata for text types, teachers help the communication problem writers and reader have with procedures.

This is not an easy task for teachers for many reasons. A primary reason is that although "grammars" have been produced for narratives, none has been produced for expository or descriptive texts since no valid taxonomies of text types exist. Identifying the cognitive structures associated with text types is a difficult task because the psychological,

rhetorical, literary, and philosophical taxonomic models that presently exist are inadequate. Once valid taxonomies and grammars developed for all text types, they must be tested developmentally to determine which schemata are available at various ages and to determine the consequences of their availability or absence.

Teachers also face the problem of whether to help students acquire global or specific writing and reading schemata. A few general text types or frames (comparison/contrast, argumentation, classification, narration, or the Step, Stack, Chain, and Balance designs, for instance) are found throughout the school curriculum and should be taught because they are limited in number, pervasive, and frequently used. Yet each content subject and culture or subculture has its own specific text types, frames, units, or genres that should also be taught. Of course, once these specific schemata have been identified, the educators' task will be easier.

A cognitive approach to the reading-writing relationship also stresses metacognition, which refers to the degree of understanding. Just as there are degrees of schemata completeness, there are degrees of understanding something. Metacognitive skills allow a student to detect failures in composing and comprehending processes. Fully understanding a text type requires that a student be able to use it appropriately and describe his knowledge overtly; partially understanding involves either appropriate use or verbalization of text type rules and processes. Students are helped to acquire rules for text types when they verbalize them or explicitly

state reasons for their moves in the composing and comprehending process. Explicitly stating rules and moves also accelerates transfer and reflective skills. Other essential metacognitive skills include the self-regulatory procedures of checking problem-solving outcomes, planning next moves, monitoring attempts, testing, revising, and evaluating strategies for learning to compose and comprehend text types.

Conclusions and Implications

With a cognitive approach to writing and reading relationships, it seems plausible that composition and comprehension are very much alike: both use schemata for subject matter, micro and macro structure, and procedures. It is also possible that better reading could be an outgrowth of writing rather than the opposite notion; writing can be considered a reading-readiness skill. Writing and reading should be taught conjointly with equal amounts of time spent on each for they are reciprocally beneficial. If this were done in all grades, no doubt learning to read and write as well as writing and reading to learn would be done more efficiently. The sooner students become expert writers and readers, the sooner they can role play and become even more expert, with writers becoming writer-based and readers becoming writer-based. For this to happen, students must be exposed to types of everything--types of narratives, types of descriptions, types of expository prose, types of poems, types of letters, types of definition, types of reports. The curriculum must be broad enough to insure student familiarity and control of these types. Students should see examples and

tasks for the types in all subjects--in basals, social studies, math, science, literature, home economics, literature, grammar business, in textbooks, workbooks and supplementary texts and on tests of all types. The examples and tasks should be on all levels and of varying lengths. Teachers must teach convention, the conventional, typical openers for stories, reports, essays; typical body organizations, typical transitions, typical closings. With a repertoire of introduction, middles, conclusions, of formulaic algorithms, of commonplaces, students will have a tool kit for "constructing" texts. This means teacher education institutions that select quality students, provide rigorous course work in compositions of all types, require comprehension of all kinds of text types, and require knowledge of conventions for culture-specific genre, and content or profession-specific texts used in academic and non-academic settings. In short, there must be reading and writing across the curriculum with standards.

Unless educational publishers change basal materials--readers, workbooks, ditto sheets and manuals--content area instructional materials, language arts texts, remedial and developmental reading materials, teachers will find it very difficult unless they produce their own materials, to provide opportunities for students to acquire and develop schemata needed to learn reading and writing expertise.

Teaching students to write a wide variety of types certainly will not solve all their comprehension problems, for it does not address the problems

of prior knowledge of content vocabulary, or tone, all of which bear on comprehension. It should, however, make them better at following the organization of the text, an important comprehension skill, better composers, and better thinkers. Both teachers and students must become more aware of the composition-comprehension relationship. Students must play the complimentary roles of writer/reader; reading teachers must be composition-oriented and composition teachers, reading-oriented. The result will be a more literate society.

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